

Coordination and Response

Question Paper 4

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Coordination and Response
Paper Type	(Extended) Theory Paper
Booklet	Question Paper 4

Time Allowed: 63 minutes

Score: /52

Percentage: /100

- 1 (a) Movement is a characteristic of living organisms.

Define the term *movement*.

.....
..... [1]

When the hand is stimulated by a hot object a reflex action occurs in which the fore-arm is raised.

Fig. 2.1 shows the muscles and the neurones involved in the reflex action.

The arrows show where there are nerve impulses during the reflex action.

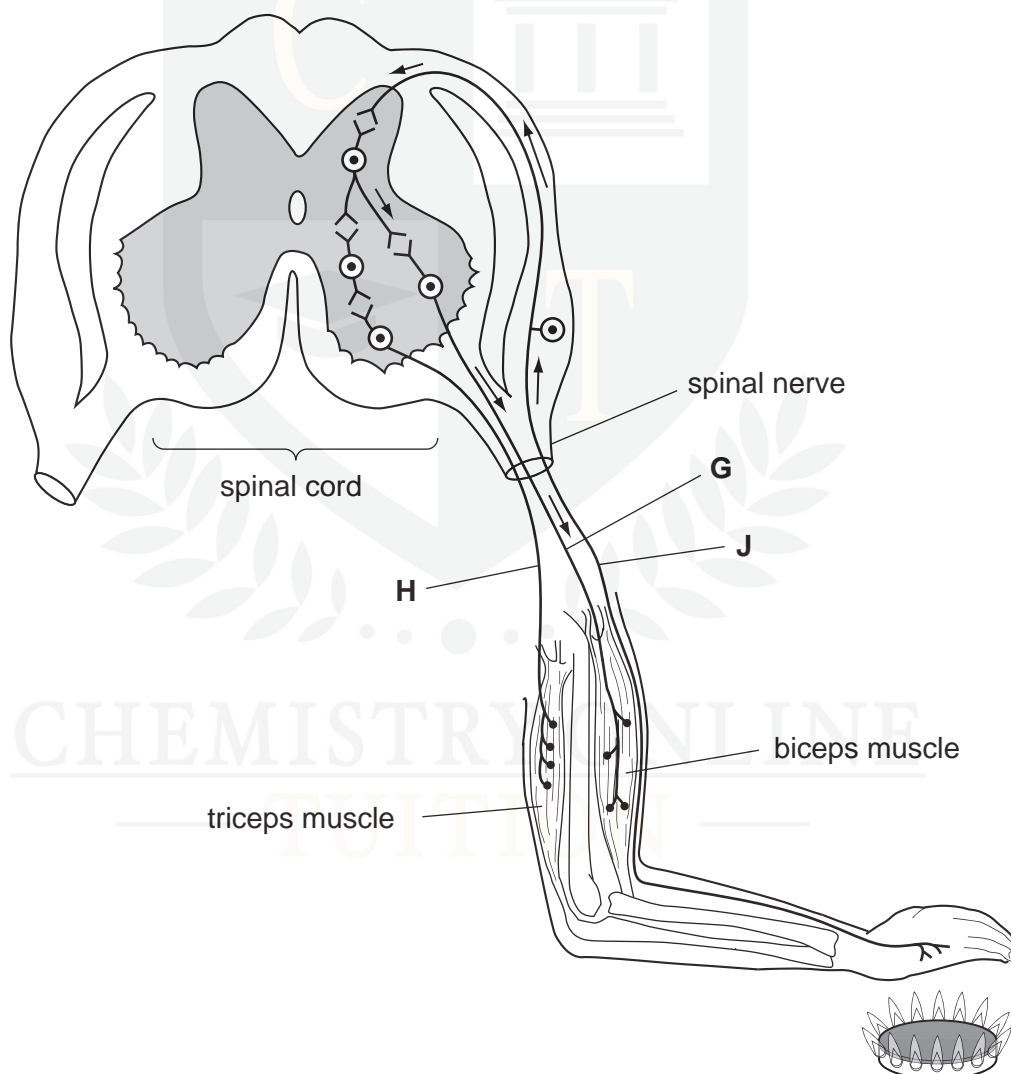


Fig. 2.1

- (b) (i) State the name for the action of two opposing muscles, such as the biceps and the triceps.

..... [1]

(ii) Explain how two opposing muscles bring about movement at the elbow joint.

[3]

(c) (i) Describe the function of neurone J.

[2]

(ii) Explain why there are impulses in motor neurone **G**, but not in motor neurone **H**.

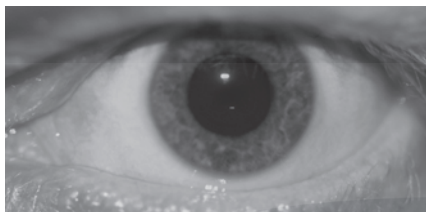
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(d) The action shown in Fig. 2.1 is an involuntary reflex action. The muscles can also be used for voluntary actions.

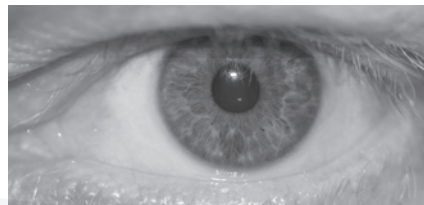
Explain how muscles are controlled during voluntary actions.

[2]

2 Fig. 2.1 shows the changes that occur to the iris when a light is switched on.



before light is switched on



after light is switched on

Fig. 2.1

(a) Describe **and** explain the change to the eye as the light is switched on.

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..... [2]

(ii) Explain why the change you described is necessary.

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..... [2]

(iii) Distinguish between the functions of rods and cones in the eye.

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..... [2]

Fig. 2.2 shows the neurones involved in stimulating the muscles in the iris when the changes shown in Fig. 2.1 take place.

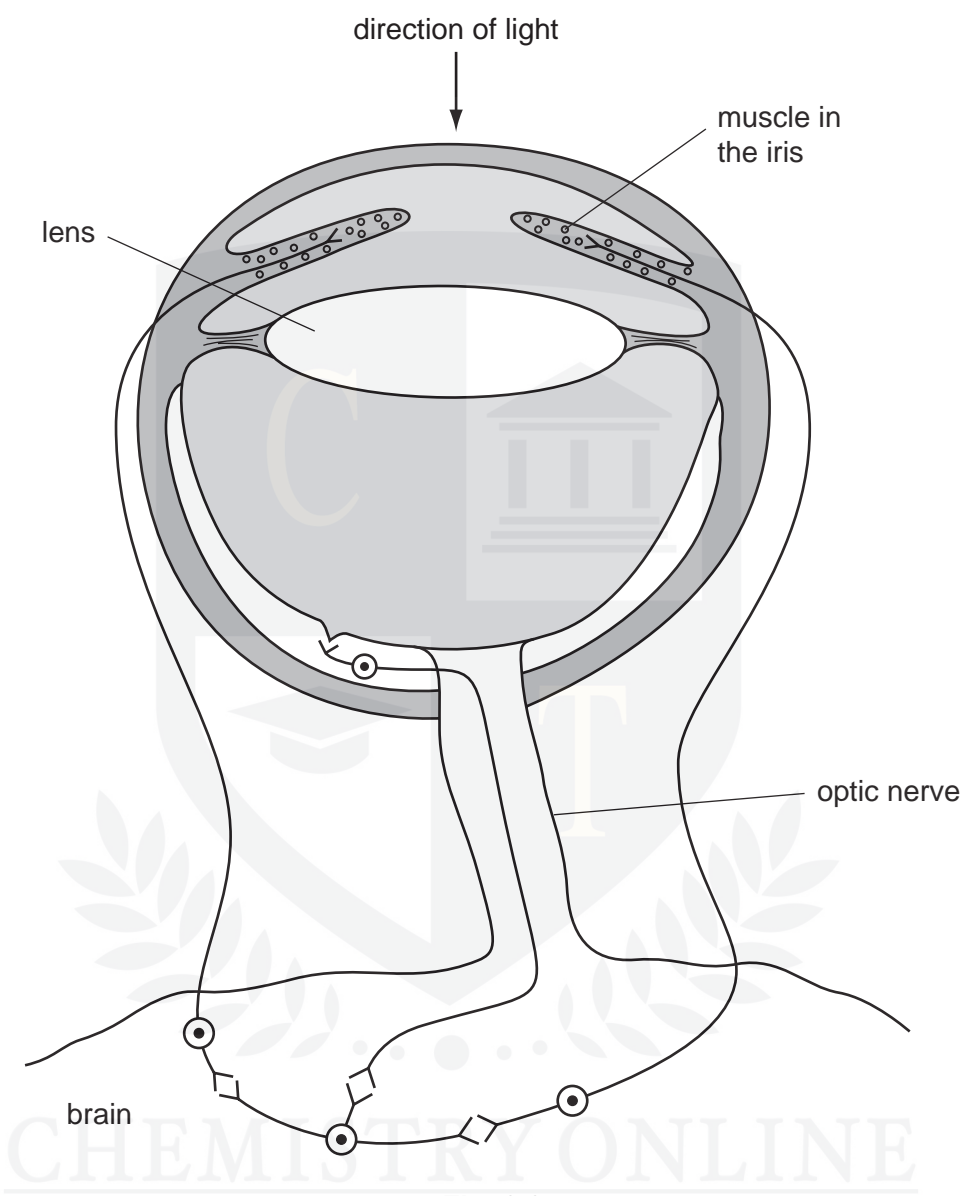


Fig. 2.2

- (b) On Fig. 2.2 draw an arrow on each of the **four neurones** to show the direction taken by the impulses when the light is switched on. [1]

- (c) Muscles in the iris are described as antagonistic.

Explain the term *antagonistic* using the muscles in the iris as an example.

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..... [3]

- (d) Neurones that terminate in the adrenal gland stimulate the release of adrenaline into the blood.

- (i) Describe situations when adrenaline would be released from the gland into the blood.

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..... [3]

- (ii) State **one** advantage of releasing adrenaline to coordinate the body rather than using nerve impulses.

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..... [1]

[Total: 14]

- 3 (a) Define the term *sensitivity*.

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..... [2]

Fig. 1.1 shows a horizontal section through the eye.

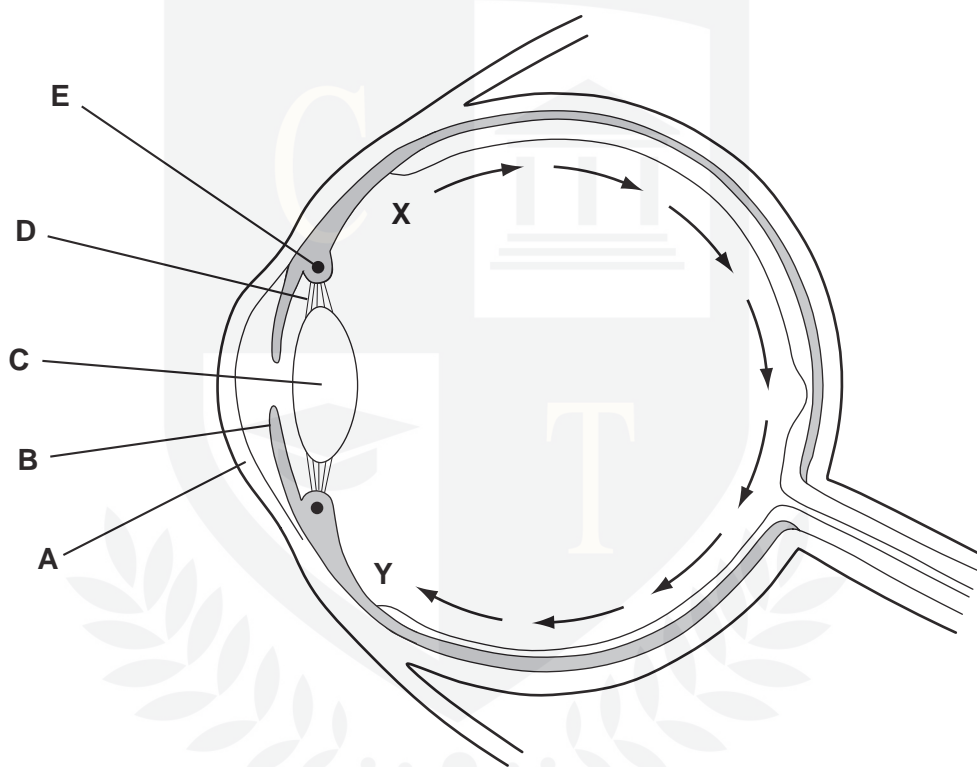


Fig. 1.1

- (b) Name structures **A** to **D**.

A

B

C

D [4]

- (ii) State the functions of structures **B** and **E**.

B

E [2]

The retina contains light-sensitive cells known as rods and cones. The distribution of rods in the retina from point **X** to point **Y**, as shown on Fig. 1.1, was investigated.

Fig. 1.2 shows the distribution of rods in the retina from point **X** to point **Y**.

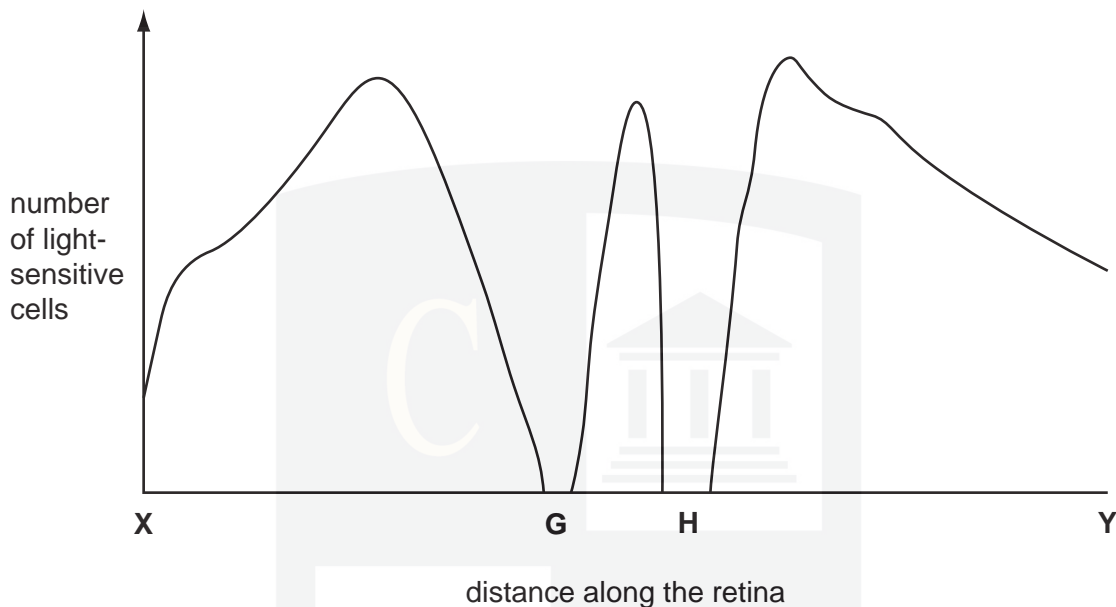


Fig. 1.2

(c) **G** and **H**, as shown on Fig. 1.2, are parts of the retina.

Name **G** and **H**.

G

H [2]

(ii) Describe the function of the rods.

.....

 [2]

(iii) Draw a line on Fig. 1.2 to show the distribution of cones in the retina. [2]

[Total: 14]

- 4 (a) Define the terms *sensitivity* and *involuntary action*.

sensitivity

.....

involuntary action

.....

[3]

Fig. 1.1 shows the reflex arc for the knee jerk reflex.

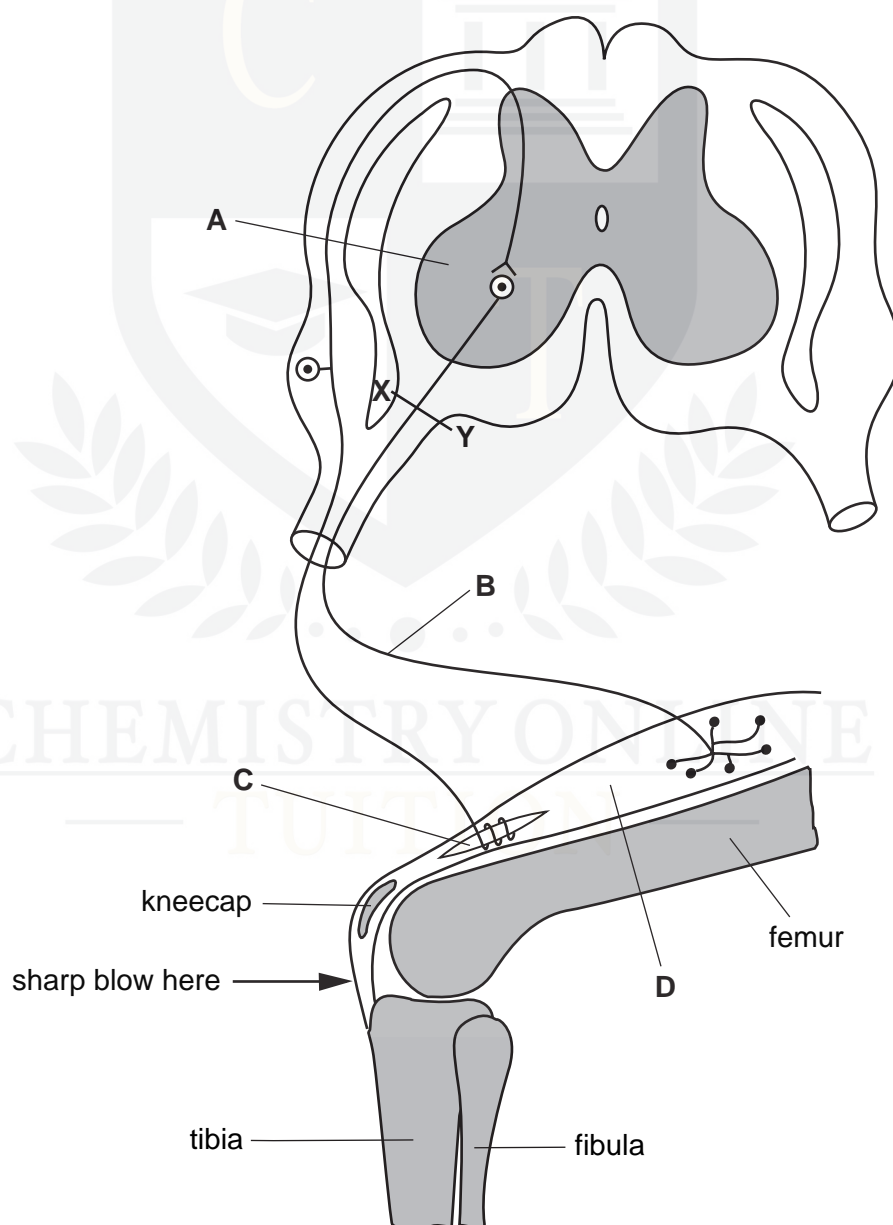


Fig. 1.1

(b) Name parts **A** to **D**.

A
B
C
D [4]

(ii) Nerve cells use active transport to move ions across their cell membranes.

Explain what is meant by the term *active transport*.

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.....
..... [2]

(c) Explain what would happen to the reflex shown in Fig. 1.1 if the nerve was cut across at **X-Y**.

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..... [3]

(d) Fig. 1.2 shows the grasping reflex of a baby.

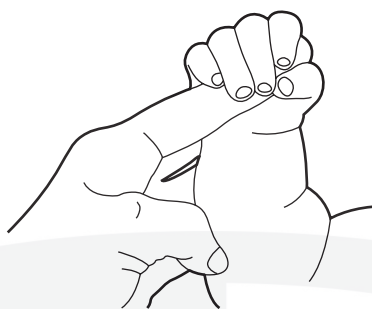


Fig. 1.2

Suggest why it is a good idea to test a baby's reflexes immediately after birth.

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..... [1]

[Total: 13]

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